

**REMARKS**

Applicant respectfully submits that the present invention is distinguishable over each of the prior art references cited by the Examiner, and in support presents the following arguments.

In commenting upon the references and in order to facilitate a better understanding of the differences that are expressed in the claims, certain details of distinction between the references and the present invention have been mentioned, even though such differences do not appear in all of the claims. It is not intended by mentioning any such unclaimed distinctions to create any implied limitations in the claims. Not all of the distinctions between the prior art and Applicant's present invention have been made by Applicant. For the foregoing reasons, and without prejudice, Applicant reserves the right to submit additional evidence showing the distinctions between Applicant's invention to be non-obvious in view of the prior art.

The remarks herein are intended to assist the Examiner in re-examining the application and in the course of explanation may employ shortened or more specific or variant descriptions of some of the claim language. Such descriptions are not intended to limit the scope of the claims; the actual claim language should be considered in each case. Furthermore, the remarks are not to be considered to be exhaustive of the facets of the invention that render it patentable, being only examples of certain advantageous features and differences that Applicant's attorney chooses to mention at this time.

**Response to 35 U.S.C. § 102 Rejection**

**Sturwold fails to teach a transesterified fatty acid ester**

Applicant respectfully submits that independent claim 2 contains elements not found in Sturwold (US 4,067,817) ("Sturwold"). Claims 4-5, 11,13, 19-24, 32-33, and 37 depend from claim 2 and therefore incorporate the same limitations as the independent claim 2 and are patentably distinct.

Claim 2 requires a composition including reaction products from a reaction of a ricinoleic acid with a compound containing a hydroxyl functional group in the presence of a phosphorus-containing acid, the reaction products including a **transesterified** fatty acid ester and a phosphorus-containing compound. As the Examiner notes, Sturwold states that the invention teaches "Mixed ester products obtained by treatment of a triglyceride under transesterification conditions with a polyoxyalkylene glycol and a high molecular weight dicarboxylic acid." (Sturwold, Abstract). However, while Sturwold uses the term "transesterification" throughout the specification, the reaction demonstrated is esterification, not transesterification. Sturwold has merely mis-labeled or re-defined the type of reaction performed. As a result of the differences in reaction between claim 2 and Sturwold, Sturwold achieves results that are entirely different from the current invention. In short, the current invention creates a different product made by a different process.

For purposes of simplicity, the composition of claim 2 is referred to in the schematics below as the Thermolube composition. The teachings in Sturwold do not anticipate each element of claim

2. The intent of the chemistries described by Sturwold is orthogonal to the intent of the process under review. Shown schematically, these differences become evident.

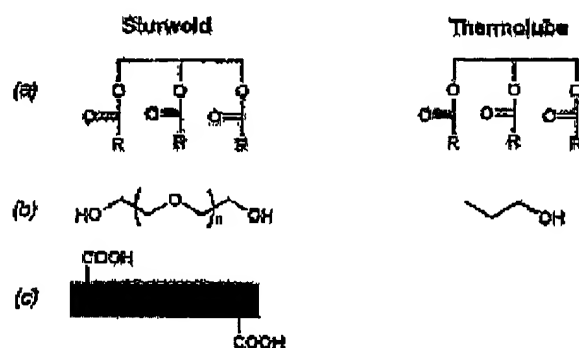


FIG 1

As shown in Fig. 1, the starting materials for both processes are common triglyceride. However, the Sturwold process involves the addition of a diol based on polyether ( $3 < n < 45$ ) and dicarboxylic acids not found naturally, but instead the product of chemical oxidation.

The chemical process of Sturwold is inherently different than claim 2 of the current invention. Claim 2 requires a transesterification process. The claim, schematically shown in Fig. 2, requires the reaction of an ester with an alcohol to provide a new alcohol based on a transfer of the carboxylic acid portion of the molecule. This is the definition of the term "transesterification".

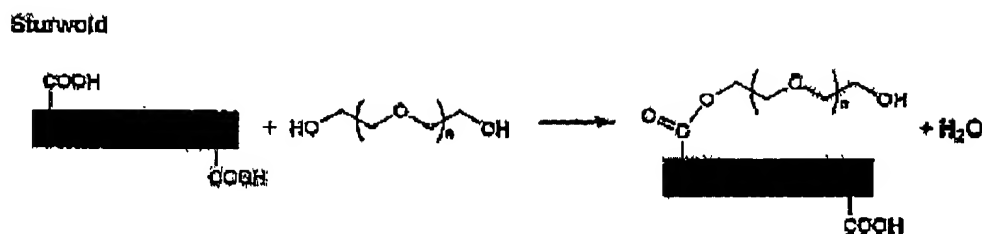
Thermolube



FIG. 2

In contrast, Sturwold teaches, not a transesterification, process but esterification. The term "transesterification" in Sturwold is used in contravention of the commonly understood definition and is believed to be erroneous. Fig. 3 shows the major products of the described Sturwold chemistries. Sturwold states "said transesterification reaction conducted until at least 25% reduction in acid value, based on initial charge, is obtained." (Sturwold, Claim 1). Subsequent claims, refine and expand the extent of esterification (not transesterification) to 50-75% (Claim 10). In this manner, Sturwold has re-defined "transesterification" to be esterification. The only process by which acid value is reduced is an esterification reaction, not a transesterification reaction.

FIG. 3.



Therefore, Sturwold is teaching esterification. The esterification reaction reduces carboxylic acid content through the formation of an ester and production of water as shown in Fig. 3. Sturwold's application of this definition is consistent throughout the entire Sturwold disclosure. For example, in the background section (Sturwold, Col. 1, Lines 9-18) Sturwold teaches that esters of polyethylene glycol (Sturwold's diol shown in Fig. 3) are useful in lubricants. Sturwold teaches that these esters can be obtained as reported by US Pat No 2925429 from dicarboxylic acids including diglycolic acid or phthalic anhydride. Sturwold distinguishes itself from prior art based on the composition of the diacid employed. This describes an esterification process.

In the detailed description, Col. 4, ll. 30-33, Sturwold teaches that "to facilitate the reaction, water formed during the transesterification process is removed using a suitable condenser/trap arrangement" and continues that low pressure or a vacuum "facilitates removal of water and drives the reaction." Furthermore Sturwold says that it is beneficial if the reaction conditions are "preferably capable of forming an azeotrope with water to facilitate removal of the water from the reaction mixture." Each of these statements in Sturwold is consistent with esterification, but inconsistent with the transesterification. While Sturwold is allowed to define transesterification in his own manner through the specification of the Sturwold patent, Sturwold's use of the word transesterification does not equate to the traditional definition of transesterification as used in current claim 2.

In summary, Sturwold teaches away from the elements of claim 2 as it focuses on esterification with polyethylene glycol diols that promote water solubility appreciably in order that emulsions can be obtained. Claim 2 teaches transesterification with alcohols that do appreciably increase water solubility and without the intent of forming emulsions. These two processes are chemically distinct in terms of both reactants and products. Therefore, transesterification is missing from Sturwold. In that at least one element is missing from Sturwold, Applicant respectfully submits that Sturwold does not anticipate claim 2.

As claims 4-5, 11,13, 19-24, 32-33, and 37 depend from claim 2, they are also patentability distinct for the same reason.

Claim 38 is distinguished from Sturwold because claim 38, as clarified through amendment, recognizes the necessity of a transesterification reaction, which is missing from Sturwold. As noted above, Sturwold does not teach transesterification, but esterification. Claims 40, 44, and 46-47 depend from claim 38 and are distinguishable for the same reasons.

Claim 114 includes a method of creating a phosphorus-containing composition by reacting a fatty acid ester comprising ricinoleic acid with an alcohol in the presence of a phosphorus-containing acid such that the reaction products include a transesterified fatty acid ester and a phosphorus-containing compound. As noted above, Sturwold teaches an esterification reaction, not a transesterification reaction. Therefore, Sturwold does not teach the transesterified fatty acid ester, among other missing elements. Claim 114 is believed to be distinguishable from Sturwold on this and other bases.

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**Response to 35 U.S.C. § 103 Rejection**

1. Applicant respectfully submits that independent claims 2 , 38 and 114 are not made obvious in view of Sturwold by the art of optimizing the process/ratio of components by one of ordinary skill in the art. Sturwold teaches an entirely different reaction with the goal of creating characteristics from the esterification that are not created using transesterification, as described above. It would not be obvious to modify Sturwold to create the invention encompassed in the independent claims 2, 38 or 114, all of which require transesterification, and those claims that depend therefrom. Furthermore, there is no suggestion or motivation identified, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the Sturwold reference to employ a different reaction which produced different products. The claims depending from the independent claims are also distinguishable on the same bases.
2. Applicant respectfully submits that claims 9, 12, 25, 34-36, and 48 are distinguishable from Sturwold in view of Haller or Klein.

Applicant respectfully submits there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the Sturwold reference or to combine teachings with Haller or Klein. The Examiner has the burden of showing, as such, and has not met it here.

Haller teaches the alcoholysis of ricinus oil in the presence of hydrochloric acid. Claim 2 and 38, from which these claims depend, require a transesterification with the acid used being a phosphorous-containing acid. Sturwold, as discussed above, teaches an esterification reaction. It is not clear how these two items, the alcoholysis process and the esterification process, could be

combined to meet the teachings of current invention as expressed in claims 9, 12, 25, 34-36 and 48. In addition to a lack of suggestion or motivation for combination, there is no reasonable expectation of success. To move the n-propanol of Haller into Sturwold would not result in the transesterification of the current invention as Sturwold does not teach transesterification, but esterification. The products created but substituting Haller's n-propanol into the Sturwold esterification would be different than the current invention. Applicant respectfully submits that Sturwold in view of Haller does not make the current invention obvious.

Regarding Sturwold in view of Klein, Sturwold fails to teach a transesterification reaction as noted above. Klein also fails to teach a transesterification reaction. Even if there were a suggestion or motivation to combine Sturwold with Klein, this element would still be missing. It is noted by the Examiner that similar processing of similar reactant compositions is expected to result in similar product. Klein uses similar reactants in a different process and gains different results. Klein teaches a reaction of two compounds, namely, castor oil and an acidic catalyst such as phosphoric acid. Klein then discusses mixing, not reacting, the resulting Klein product with any of a laundry list of components. Klein's resulting product is not a transesterified fatty acid ester but a mixture of the dehydrated castor oil taught in Klein with any number of other components. Klein solely describes a process of dehydration of castor oil under conditions optimized to prevent polymerization. Applicant notes that no transesterification with exogenous alcohols is possible because alcohols are never added for reaction. This physical mixture of alcohol and dehydrated castor oil is completely different from the transesterified fatty acid ester resulting from and required by the claims of the current invention. Sturwold does not teach a transesterified fatty acid ester, but an esterification product. Together, even if there were



motivation to combine, they would not form the transesterified fatty acid of the current invention.

There is nothing explicit in Klein that would suggest modification, there is also nothing implicit suggesting combining the reference with other unrelated chemical processes (i.e. transesterification). The Klein teachings, knowledge of one of ordinary skill in the art, and nature of the problem to be solved, as a whole, would not suggest doing so to those of ordinary skill in the art, as is required in MPEP 2143.01 and *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). Not only is there no suggestion as to the desirability of the combination, discussed above, but also the combination would not in fact be desirable, as the teachings of Klein relate to reducing the KOH which teaches away from transesterification, as discussed in relation to Sturwold and below in relation to Klein.

Neither Klein nor Sturwold disclose a transesterified fatty acid ester. Therefore, the combination of Klein with Sturwold is missing at least one of the required elements of independent claims 2, 38 and 114 as well as all claims depending therefrom.

While Klein gives brief reference to mixing an alcohol with the product resulting from the initial reaction, there is no indication that a reaction takes place. As described above, Applicant believes that no reaction would take place upon mixing an alkanol with the dehydrated castor oil of Klein. The specification of Klein clearly teaches mixing and not reacting as the various components listed for mixing act as carriers, not reactants.

The transesterified fatty acid of the invention shows surprising results, when compared to castor oil. The declaration of Fred Massey, previously filed, indicate results of testing showing the Falex failure load for several embodiments of the current invention and that of castor oil. As

can be seen, the transesterified fatty acid ester of the invention is remarkably superior to castor oil with failure loads being triple that of castor oil.

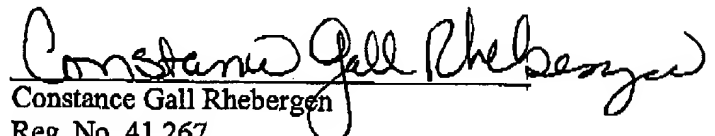
In summary, Klein teaches a dehydrated molecule derived from the starting castor oil whereas Applicant teaches a new chemical entity by virtue of a transesterification process. Klein is missing the transesterified fatty acid of the claims of this invention as is Sturwold. Claims 9, 12, 25, 34-36 and 48 are patentable for the reasons above.

In commenting upon the references and in order to facilitate a better understanding of the differences that are expressed in the claims, certain details of distinction between the references and the present invention have been mentioned, even though such differences do not appear in all of the claims. It is not intended by mentioning any such unclaimed distinctions to create any implied limitations in the claims. Not all of the distinctions between the prior art and Applicant's present invention have been made by Applicant. For the foregoing reasons, Applicant reserves the right to submit additional evidence showing the distinctions between Applicant's invention to be unobvious in view of the prior art.

The foregoing remarks are intended to assist the Examiner in re-examining the application and in the course of explanation may employ shortened or more specific or variant descriptions of some of the claim language. Such descriptions are not intended to limit the scope of the claims; the actual claim language should be considered in each case. Furthermore, the remarks are not to be considered to be exhaustive of the facets of the invention, which render it patentable, being only examples of certain advantageous features and differences that Applicant's attorney chooses to mention at this time.

Reconsideration of the application and allowance of all of the claims are respectfully requested. In view of the foregoing Response, Applicant respectfully submits that all of the claims are allowable, and Applicant respectfully requests the issuance of a Notice of Allowance. Should further discussion regarding the application be desired by the Examiner, a telephone conference is respectfully requested. I can be reached at (713) 221-3306.

Respectfully submitted,

  
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